Undergraduate Catalog of Courses

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Environmental Science And Studies Programs

Saint Mary's College of California

ENVIRONMENTAL SCIENCE AND STUDIES PROGRAMS

The Environmental Science and Studies (ESS) programs instill in students knowledge from many disciplines. This knowledge is applied to the study and management of the environment. Students examine the structure, function and dynamics of ecosystems, the interaction between physical and living systems, and how human enterprise is adversely affecting environmental quality. They explore how environmental degradation and pollution can be lessened or prevented by the application of sound management principles derived from ecological theory. In the study of the environment, students obtain the satisfaction of working toward an understanding of the natural systems around them, the opportunity to acquire the skills necessary to participate in the solution of serious environmental problems and the insights essential to a successful search for rational alternatives to present forms of ecosystem mismanagement. The programs foster critical thinking and holistic ways of knowing, and offer a variety of specific approaches from the experimental protocols of the natural sciences to ones that are similar to those of the social sciences and humanities. It seeks to achieve a balance between the empirical and normative aspects of environmental study.

The location of Saint Mary's College, near urban and suburban centers as well as a diversity of natural areas including tidal, freshwater, estuarine and marine systems; a delta, mountains, lakes, deserts, forests, valleys and scrub lands, allows access to an impressive array of study sites ranging from the relatively undisturbed to the severely impacted. Internships are available to offer first-hand experience in a variety of fields.

FACULTY

Bill Perkins, Ph. D., *Director of Environmental Science and Studies Program (Geology, Geophysics, GIS, Hydrology)*
Roy Allen, Ph.D., *Professor of Economics (Natural Resource Economics and Human Ecology)*
Steven Bachofer, Ph.D., *Professor of Chemistry (Environmental Chemistry)*
Carla C. Bossard, Ph.D., *Professor of Biology (Plant Science, Ecology, Terrestrial Systems)*
Glenna Breslin, Ph.D., *Professor of English (Nature Writing)*
Joel Burley, Ph.D., *Professor of Chemistry (Atmospheric Chemistry, Environmental Chemistry)*
Greg Croft, Ph.D., *Lecturer in ESS Program (Geophysics, Resource Evaluation)*
Larry Cory, Ph.D., *Professor of Biology (Evolution, Environmental Perturbations)*
John Ely, Ph.D., *Associate Professor of Sociology and Anthropology (Society and the Environment)*
Philip Leitner, Ph.D., *Professor of Biology (Desert Ecology, Climate Change)*
Gretchen Lemke-Santangelo, Ph.D., *Professor of History (U.S. Environmental History)*
Lidia Luquet, Ph.D., *Associate Professor of Mathematics (Environmental Systems and Biological Modeling)*
Asbjorn Moseidjord, Ph.D., *Professor of Economics (Environmental Economics)*
Ron Olowin, Ph.D., *Professor of Physics and Astronomy (Geosciences, Environmental Modeling, Astronomy)*
Roy Wensley, Ph.D., *Professor of Physics and Astronomy (Computational and Ecosystem Modeling)*

LEARNING OUTCOMES

When students complete the Environmental Science and Studies programs, they will be able to:

- RECALL and synthesize the knowledge derived from biology, chemistry, physics, earth science, economics and political science to better understand the earth's environment
- COMPREHEND environmental problems from multiple perspectives
- EVALUATE the credibility of varying sources of information on environment
- DISPLAY cognizance of ethical considerations and be mindful of them when constructing solutions to environmental problems
- RECOGNIZE the interconnectedness of earth's ecosystems and human dependence on them
- COMMUNICATE skillfully environmental findings through seminars, written scientific reports and visual presentations
- KNOW how to find information on environmental topics from library sources, original scientific literature and the Internet
- DEMONSTRATE competence in using the basic equipment used to gather information on the environment
- RECOGNIZE processes and patterns of environmental interactions

CURRICULUM AND COURSE REQUIREMENTS

Two degrees are offered. A bachelor of science (BS) in Environmental Science and a bachelor of arts (BA) in Environmental Studies. The bachelor of arts program involves less scientific rigor than the bachelor of science. Three minors are also offered in Environmental Science, Environmental Studies and Earth Sciences. The Studies program hosts an ongoing seminar series with three presentations per year, coordinated by the program director. This series includes broad areas of interest related to the environment, from poetry to science, and will include field trips to sites of interest on occasion. All majors in the program will be required to attend at least six of these special events in addition to their course requirements. All environmental science and studies majors will also be required to do either a research internship or a senior research thesis (such as the ongoing summer research program in the School of Science) or a senior project.

ENVIRONMENTAL SCIENCES MAJOR (BS)

Required: 16 courses plus a senior project

SEVEN REQUIRED LOWER DIVISION COURSES

EES 40/41 Geology and the Earth
Chem 8/9 General Chem 1
Chem 9/10 General Chem 2
Math 27 Calculus 1
Biol 1 Cell, molecular and genetics
Biol 2 Organisms – evolution
Physics 10/20 General Physics for biologists

FOUR REQUIRED UPPER DIVISION COURSES

Bio 119 or Math 113 Biostats or equivalent
Econ 150 Environment and Natural Resources Economics
Pol 135 or 136 Environmental Politics (or Pol 136 Env Law)
Biol 125 General Ecology

FIVE UPPER DIVISION ELECTIVES

EES 100 Hydrology
EES 110 Geographic Information Systems
EES 140 Environm. Geology/Nat. Disasters
EES 175 Wetlands
Bio 113 Marine Biology
Bio 142 California Flora
Bio 144 Botany
Bio 152 Conservation Biology
Chem 119 Environmental Chemistry
Chem 104 Organic Chem 1
Chem 106 Organic Chem 2
Chem 108 Separation and Identity

Senior Project (.25)
EES 197 Independent Study/Senior project

ENVIRONMENTAL STUDIES MAJOR (BA)

Required: 13 courses plus a senior project

FOUR REQUIRED COURSES

Math 4 Statistics and Probability
Econ 150 Environment and Natural Resources Economics
Pol 135 Environmental Politics (or Pol 136 Env Law)
EES 100 Hydrology

FOUR LOWER DIVISION ELECTIVES FROM FOLLOWING, INCLUDING ALL LABS

EES 40/41 Lab Geology and the Earth
EES 60/61 Lab Urban Environmental Issues
Phy 40/Lab Physics
EES 92/93 Lab Environmental Science
Biol 50/Lab General Biology

FIVE UPPER DIVISION ELECTIVES AS BELOW

Three courses from the following
Phil 117 Philosophy of Nature
Phil 130 Environmental Ethics
Hist. 155 Environmental History of Latin America
Soc 134 Society and Environment
Pol 136 Environmental Law

Two courses from the following
EES 110 Geographic Information Systems
EES 140 Environm. Geology/Nat. Disasters
EES 175 Wetlands
Bio 125 Ecology
Bio 113 Marine Biology
Bio 142 California Flora
Bio 144 Botany
Bio 152 Conservation Biology

Senior Project (.25)
EES 197 Independent Study/Senior project

**Those who do not meet the requisite courses will need permission of the instructor.*

ENVIRONMENTAL SCIENCE MINOR

Choose 3 lower division courses
EES 92 Environmental Science
Bio 50 General Biology
EES 40 Physical Geology
EES 60 Urban Environmental Issues

Choose 3 upper division courses
EES 100 Hydrology
EES 110 GIS
EES 175 Wetlands
Bio 142 Cal Flora
Bio 144 Botany
Bio 152 Conservation Biology

ENVIRONMENTAL STUDIES MINOR
Choose 3 lower division courses

Bio 152 Conservation Biology
Econ 150 Natural Resource Economics
Pol 135 Environmental Politics
Pol 136 Environmental Law
EES 100 Hydrology
EES 110 GIS

EARTH SCIENCE MINOR
Choose 3 lower division courses

EES 40 Physical Geology
EES 50 Historical Geology
EES 92 Environmental Science

Choose 3 upper division courses
EES 100 Hydrology
EES 110 GIS
EES 140 Natural Disasters
Econ 150 Natural resource Economics

One of the following
Biol 113 Marine Biology
Biol 142 Cal Flora
Biol 144 Botany
Biol 146 Ecophysiology